

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 22 MAR 2006

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Applicant's or agent's file reference TS 5589 PCT	FOR FURTHER ACTION See Form PCT/PEA/416	
International application No. PCT/EP2005/050857	International filing date (day/month/year) 01.03.2005	Priority date (day/month/year) 02.03.2004
International Patent Classification (IPC) or national classification and IPC C10G65/12		
Applicant SHELL INTERNATIONAL RESEARCH MAATSCHAPPIJ B.V.		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau) a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand 28.12.2005	Date of completion of this report 21.03.2006	
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**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2005/050857

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-18 as originally filed

Claims, Numbers

1-10 as originally filed

Drawings, Sheets

1/1 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-10
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-10
Industrial applicability (IA)	Yes: Claims	1-10
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

The following documents (D) are referred to in this communication; the numbering will be adhered to in the rest of the procedure:

D1: EP-A-0272729
D2: WO-A-0250213
D3: US-A-3876522

V.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-10 does not involve an inventive step in the sense of Article 33(3) PCT.

V.1.1 Document **D1** (Figure IV; column 1, lines 9-12; column 2, lines 36-44; column 2, line 50 - column 3, line 10; column 7, lines 27-42; column 10, lines 43-46; column 11, lines 5-25; column 11, line 49 - column 12, line 6), which is considered to represent the closest prior art to the subject-matter of claim 1, discloses a process comprising (i) the hydrocracking of a flashed distillate stream; (ii) the distillation of the effluent to obtain a kerosene, a gas oil, a 320-370°C fraction and a residue; (iii) the separate catalytic dewaxing in two parallel units of both the 320-370°C fraction and the residue; (iv) the hydrotreatment of both dewaxed streams and (v) the distillation of the combined hydrotreated effluents to produce various lubricating base oil fractions. The two catalytic hydrodewaxing units operate under different process conditions adapted to the desired quality of the produced lubricating base oils (column 6, lines 46-53). This document thus also describes the continuous preparation of two or more base oil fractions by the combination of hydrocracking, hydrodewaxing and hydrotreatment.

The subject-matter of claim 1 of the present application mainly differs from the process of D1 in that the effluent from hydrocracking is first distilled to separate a full range residue boiling above 340°C and this residue is further separated by distillation into a light base oil precursor fraction and a heavy base oil precursor fraction and in that only the heavy base oil precursor fraction is hydrotreated after dewaxing.

The problem to be solved by the present invention may therefore be regarded as to provide an alternative process for simultaneously preparing two or more base oil grades by the

combination of hydrocracking, catalytic dewaxing and hydrotreatment.

The solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

Alleged advantages to which the applicant merely refers, without offering sufficient evidence to support the comparison with the closest prior art, cannot be taken into consideration in determining the problem underlying the invention and therefore in assessing inventive step.

In the absence of technical evidence showing any advantage the separation of a residue boiling above 340°C into a light and a heavy precursor fraction offers over the separation of a 320-370°C fraction and a residue disclosed in the closest prior art, no inventive step can be acknowledged for claim 1. The 320-370°C fraction separated from the hydrocracked effluent in D1 is at least partly identical to the light base oil precursor fraction separated from the 340°C+ residue in the process of the invention.

It is further common practice to subject only the heavier base oil fractions to hydrofinishing to remove heteroatoms as well as saturate olefins and aromatics.

Dependent **claims 2-10** do not appear to contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step.

It would be obvious for a skilled person to apply more severe catalytic dewaxing conditions to the heavy base oil precursor fraction in order to obtain base oil grades of desired quality.

Document **D3** (column 1, lines 46-66; Figure 2) discloses a process for preparing two or more lubricating oils comprising (i) hydrocracking vacuum distillates or deasphalted oils mainly boiling above 650°F; (ii) fractionating the effluent into two or more lubricating oil cuts; (iii) separately solvent dewaxing each of the cuts; (iv) separately hydrogenating each of the dewaxed cuts and (v) isolating the lube oils. The 925-1050°F fraction and the 1050°F+ fraction of Example 1 respectively correspond to the light base oil precursor and the heavy base oil precursor fractions defined in claim 1 of the present invention. This document could be used similarly to D1 for assessing inventive step of the present invention.

~~V.1.2~~ Document **D2** (claim 1; figures 1 and 2; examples 1 and 2; page 7, lines 10-13 and 21-26; page 8, lines 16-25 and page 13, line 24 - page 14, line 11), which could also be considered to represent the most relevant state of the art, discloses a process to sequentially

prepare a spindle oil, a light machine oil and a medium machine oil comprising (i) the alternating vacuum distillation of a hydrocracking residue to obtain a spindle oil, a light machine oil and a medium machine oil fraction; (ii) the separate and sequential catalytic dewaxing of these base oil precursor fractions in blocked out mode in a single dewaxing unit after their separate storage and (iii) the separate hydrofinishing of light and medium machine oils in a single unit.

The subject-matter of claim 1 of the present application mainly differs from the process of D2 in that the base oil precursor fractions obtained by distillation of the hydrocracking residue are simultaneously dewaxed in parallel operating catalytic dewaxing reactors.

The problem to be solved by the present invention may therefore be regarded as to provide a process for simultaneously preparing two or more base oil grades by the combination of hydrocracking, catalytic dewaxing and hydrotreatment.

Document D1 teaches the continuous preparation of two or more base oil fractions by separate catalytic dewaxing in two parallel units of two base oil precursor fractions and the distillation of the combined hydrotreated and dewaxed effluents to produce various lubricating base oil fractions.

In view of the teaching of D1, the skilled person would consider changing the mode of the catalytic dewaxing of the base oil precursor fractions in D2 from a blocked out mode in a single apparatus to a continuous mode in parallel reactors in order to simultaneously produce various base oil grades without having to exercise any inventive skills.

Consequently, the subject-matter of **claims 1-10** appears to lack an inventive step over D2 taken in combination with D1.

V.2 Further Objections

The term "substantially" used in claim 1 is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refer/s, thereby rendering the definition of the subject-matter of said claim unclear, Article 6 PCT.

V.3 Remarks

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

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In light of documents D1 and D2 cited in the International Search Report, the International Preliminary Examination Authority considers that the invention according to claims 1-10 does not appear to meet the criteria of Article 33(1) PCT.